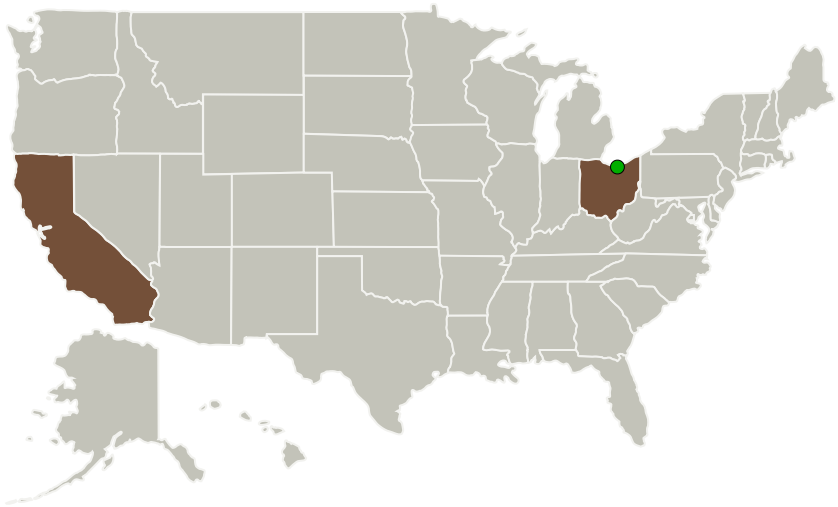
# Deployable Ka-Band Reflectarray, Phase I

Completed Technology Project (2016 - 2017)

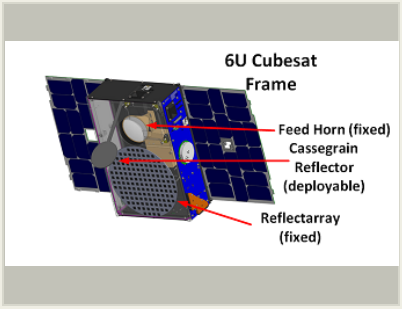
## Project Introduction

Tyvak, in collaboration with UCLA, proposes a novel approach to the challenge of creating a large reflector for Ka-band high data rate links. We propose to attach the primary reflector surface permanently to the surface of a 6U spacecraft and illuminate the reflector using a Cassegrain style subreflector with an illuminating antenna that is permanently mounted to the transmitter / receiver inside the satellite. While other approaches focus on deploying the reflector surface itself, including Tyvak?s own deployable dish project, this proposed innovation uses minimal moving parts to achieve a high gain design.

## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Tyvak Nano-Satellite Systems Inc. | Lead Organization | Industry | Irvine, California |
| Glenn Research Center(GRC) | Supporting Organization | NASA Center | Cleveland, Ohio |
| University of Southern California(USC) | Supporting Organization | Academia<br>Asian American Native American Pacific Islander (AANAPISI) | Los Angeles, California |




Deployable Ka-Band Reflectarray, Phase I

## Table of Contents

# Deployable Ka-Band Reflectarray, Phase I

Completed Technology Project (2016 - 2017)

| Primary U.S. Work Locations | |
|---|---|
| California | Ohio |

## Project Transitions

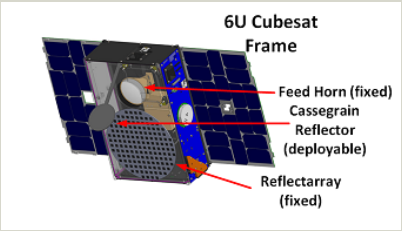
**June 2016:** Project Start

**June 2017:** Closed out

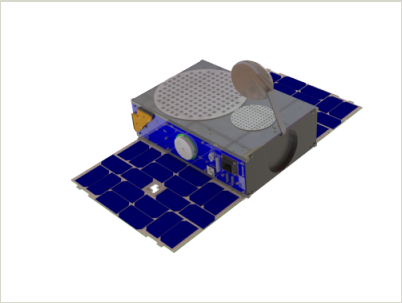
**Closeout Documentation:**

- Final Summary Chart*(https://techport.nasa.gov/file/139718)*

## Images




**Briefing Chart Image**
Deployable Ka-Band Reflectarray, Phase I
*(https://techport.nasa.gov/image/133716)*



**Final Summary Chart Image**
Deployable Ka-Band Reflectarray, Phase I Project Image
*(https://techport.nasa.gov/image/133021)*

## Organizational Responsibility

**Responsible Mission Directorate:**
Space Technology Mission Directorate (STMD)

**Lead Organization:**
Tyvak Nano-Satellite Systems Inc.

**Responsible Program:**
Small Business Innovation Research/Small Business Tech Transfer

## Project Management

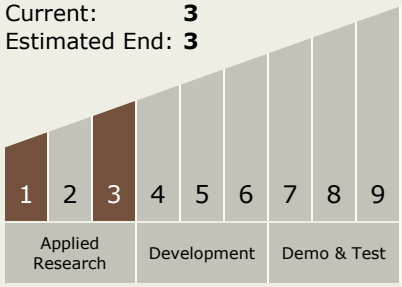
**Program Director:**
Jason L Kessler

**Program Manager:**
Carlos Torrez

**Principal Investigator:**
Jacob Portukalian

## Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



# Deployable Ka-Band Reflectarray, Phase I

Completed Technology Project (2016 - 2017)

## Technology Areas

**Primary:**

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.2 Radio Frequency
    - TX05.2.6 Innovative Antennas

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System